

PORTABLE COMPUTER STAND FOR A LAPTOP COMPUTER

1       TECHNICAL FIELD OF THE INVENTION

2                  This invention relates generally to computer furniture.  
3                  More specifically, the invention relates to a portable work  
4                  surface to support a portable computer while working from home or  
5                  traveling. This invention provides a surface for a user to  
6                  conveniently work anywhere, even using a portable computer. The  
7                  novel features of this invention include its sturdiness, its  
8                  specific design which increases a user's comfort during operation  
9                  of a laptop, and its improved design to fold easily to fit within  
0                  a briefcase.

11        BACKGROUND OF THE PRESENT INVENTION

12                  The need for a convenient portable stand for laptop owners  
13                  has long been apparent. As the prevalence of computers has  
14                  increased, so too has the number of laptop computers being  
15                  utilized. Computers are generally of the desktop variety,  
16                  allowing a user to comfortably use the computer while seated at a  
17                  desk. The portable computer, or laptop, demands a similar  
18                  comfort for users in an increasing variety of locations.  
19                  Typically, a computer stand for a laptop provides only a surface  
20                  for the computer to rest. It has replaced the use of one's lap

1 as the primary surface on which one would rest such a computer.  
2 This concept generally has several advantages, such as, keeping  
3 the user from possibly burning his legs from the heat generated  
4 by the internal components of the computer, and allowing the user  
5 more comfortable seating during use.

6 The concept of portable tables and collapsible tables is not  
7 a new one. Such tables attempt to provide maximum comfort for  
8 users who need a work surface for any reason in a wide variety of  
9 locations. These tables are typically used in a location which  
10 contains another convenient flat top on which to work.

11 Currently, portable tables are used for many different uses,  
12 including eating, working, reading, and writing. With the  
13 increasing amount of portable computers, notebook computers,  
14 laptops and personal digital assistants (PDA's), such tables are  
15 used to support computers, PDA's, books and utensils for work  
16 purposes, as well as plates, forks, utensils and food for eating  
17 purposes.

18 The increasing number of persons who own laptop computers  
19 often prefer to use them while in a seated position, whether  
20 sitting in a chair at home, seated vertically in bed, or while  
21 seated in transit on a train, plane, or other such transit  
22 vehicle. To use a laptop computer in such a fashion typically  
23 requires a user to place the computer on his/her lap. This  
24 method of use causes the user to sweat, and causes the user  
25 muscle fatigue, back aches and neck aches due to the hunched

1 position one must be in to use a laptop in such a fashion.  
2 Therefore, laptop users generally prefer some other method of  
3 use, such as placing the computer on a portable table, stand or  
4 other support means.

5         Also increasing is the number of (PDA) users. PDAs such as  
6 the PalmPilot® allow users to do work, write, send and receive  
7 email, schedule appointments and accomplish other useful tasks  
8 from the palm of their hand. PDA users, like laptop users,  
9 prefer to use the PDA while seated, either at home or in transit.  
10 Using such a PDA without a portable work surface requires a user  
11 to support the PDA in one hand while operating it with the other.  
12 Prolonged use of a PDA in this fashion can result in aching  
13 muscles and cramped hands. Therefore, PDA users prefer an  
14 alternative, such as placing the PDA and any accompanying  
15 paperwork on a portable table, stand or other support means.

16         U.S. Patent Numbers 1,719,614, 2,449,492, 2,476,620,  
17 3,805,710, 4,119,289, 4,726,556, 5,417,168, and 5,722,624 all  
18 disclose collapsable, portable and/or adjustable stands or tables  
19 or other support means for supporting items in convenient  
20 locations. However, each has various problems and disadvantages.  
21 For example, some are uncomfortable or bulky to use, difficult to  
22 assemble, require an existing table or desk.

23         For example, U.S. Patent Number 5,722,624, depicted in FIG.  
24 1, describes an adjustable surface that clamps onto an existing  
25 tabletop. The prior art surface offers a support means for  
26 working, which may support a laptop computer. However, use of

1       this type of support depends on an existing tabletop. That is,  
2       hooks 2 and arms 4 attach to the underside of an existing desk or  
3       table. This requirement limits the use of this type of portable  
4       surface. This prior art unit also suffers from two  
5       disadvantages. First, the user is required to hunch over to see  
6       the laptop screen, and second, that the position of a user's  
7       hands is not improved.

8               U.S. Patent Numbers 2,476,620, 3,805,710, 4,726,556, and  
9       5,417,168 each disclose portable tables which are folding,  
10      collapsible, and self-supporting. One problem with the disclosed  
11     prior art is that the unit does not fold efficiently, due to the  
12     interference of one leg by the other. The bulky legs render the  
13     unit difficult to fold, and therefore, difficult to store. The  
14     need exists to provide a portable table which folds easily and  
15     efficiently, and therefore fits easily into small spaces.

16               Another disadvantage with prior art portable surfaces is  
17     their instability. Such prior art tables include collapsible  
18     truss systems and collapsible triangular-shaped legs which are  
19     unstable and poorly balanced. U.S. Patent Numbers 3,164,353 and  
20     4,726,556 provide examples of tables with such unstable leg  
21     systems. These portable tables lack balance and stability as  
22     they threaten to collapse and dump their contents which can be  
23     costly for laptop users. Therefore, the need exists to provide a  
24     portable surface which will remain stable and balanced.

25               Further, adjustable tables are subject to a shifting center  
26     of gravity, whereby the unit becomes less stable when the unit is

1       adjusted to different heights. For example, U.S. Patent Numbers  
2       2,449,492, 2,476,620, 3,805,710, 4,119,289, 4,726,556 and  
3       5,417,168 disclose mechanisms for adjusting height adjustable  
4       tables. These mechanisms for adjusting the height of a table are  
5       often difficult or awkward to use, or involve moving parts which  
6       can be dangerous. In particular, U.S. Patent Number 5,417,168  
7       discloses a height adjustment means which uses two slidably  
8       engaged pipes with two sets of apertures, where each set of  
9       apertures represents a different height and can be selected  
10      through the use of an interlocking "catch member." The disclosed  
11      height adjustment mechanism suffers from ultra-complexity as well  
12      as difficulty. To adjust the height of the disclosed invention,  
13      it requires one to align two metal tubes on each of two legs and  
14      provide that the "catch member" penetrates both holes.  
15      Therefore, the need exists for a portable work surface which can  
16      be used easily by people of varying heights.

17           U.S. Patent Number 5,511,758 discloses a portable  
18      collapsible desk stand, depicted in FIG. 2, designed for notebook  
19      computers to help dissipate the heat from a notebook computer.  
20      The stand disclosed includes a tilt for more comfortable use,  
21      acknowledging the need for a more comfortable portable laptop  
22      stand design. However, it discloses a stand which is overly  
23      complex to use (i.e., to open and close). That is, sides 11 and  
24      11' are connected to one another with collapsible arm 13, which  
25      is secured with pins 14 and 16. This type of stand is unduly  
26      complicated and unstable for use during travel, is fixed at a low

height (not idea for maximum comfort), and is unstable and difficult to balance. For example, disclosed is a large folding 'H' created by sides 11 and 11' and collapsible arm formed by 13 and 13', the torque caused by movement on the surface of the table necessarily renders the unit unstable. Further, placing any object or objects other than a uniformly weighted object (such as a laptop computer) on top of the unit may often cause it to tip. Finally, such a unit is not designed for use during travel. The stand depicted in FIG. 2 is only useful when a user needs to work on an existing flat surface. Since the unit disclosed only has legs 11 and 11', the unit does not fit comfortably on a user's lap. Therefore, to maximize stability and efficiency, the unit needs to be supported by an already flat surface such as a table or desk. A further disadvantage is that if either of pins 14 or 16 is accidentally lost, the unit would be rendered unusable. Also, the unit does not elevate the laptop to a comfortable level, causing discomfort to a user's hands while working, and strain on a user's neck caused by constantly looking down at the screen. Therefore, the need exists for a portable, stable unit which can support a laptop, and which can be comfortably used during travel and on any surface, and which can provide a laptop user with comfort to the back, neck and hands.

Next, U.S. Patent Number 6,115,249 discloses a typical prior art laptop computer stand, as depicted in FIG. 3, having an enhanced cooling feature, and which is horizontally planar, and

1 compact in nature. This general prior art design suffers from  
2 several disadvantages. Shown are base 21 and stand member 23,  
3 with upwardly extending feet members 25, 26, 27, 28. First, the  
4 horizontally planar nature of the stand forces the typical laptop  
5 user to hunch over, straining the back, neck and shoulders. Base  
6 21 and stand member 23 do not increase the height of the unit so  
7 as to allow the user to alleviate stresses within the neck, back  
8 and shoulders. The unit does contain upwardly extending feet  
9 members 25, 26, 27, 28 to raise the bottom surface of the base of  
10 the computer stand to provide ambient air access. The upwardly  
11 extending feet members 25, 26, 27, 28 do not substantially  
12 increase the height of the laptop computer. The vertical length  
13 of upwardly extending feet members 25, 26, 27, 28 depends on the  
14 amount of cooling desired. Further, the horizontal surface  
15 forces the user to strain his/her wrists while using the laptop,  
16 by not allowing the wrists to arch. The compactness of the unit  
17 forces the typical user to hunch over to read the screen as well,  
18 as forcing the users wrists to strain while typing. In fact, the  
19 only comfort benefit which the stand depicted in FIG. 3 discloses  
20 is the removal of unwanted heat. Thus, the prior art laptop  
21 stands suffer from several disadvantages and a need exists to  
22 develop a portable computer stand which will not force a user to  
23 hunch over and strain his/her back, neck, and shoulders.

24 U.S. Patent Number 5,896,817 discloses an entire computer  
25 desk having a tilted work surface with an adjustable feature  
26 which allows a user to select the degree of tilt (e.g., between

1       30 and 60 degrees). The disadvantage of this design is that it  
2       is an entire desk design, which renders it stationary, and thus  
3       not applicable to a portable unit.

4           A need for a comfortable alternative to the prior art is  
5       widely recognized in the art. Several prior art references  
6       attempt to solve this problem. For example, in an attempt to  
7       facilitate a laptop-user's comfort, U.S. Patent Numbers  
8       5,470,041, 4,648,574 and 3,936,026 disclose a rotatable laptop  
9       computer stand support having a swivel base. U.S. Patent Number  
10      5,553,824 provides a further attempt at providing comfort by  
11      disclosing a laptop computer tray with adjustable length.  
12      Finally, United States Patent Number 5,137,236 discloses a swivel  
13      tripod support apparatus. None of these prior art patents  
14      remedied the problem associated with a laptop user's discomfort.

15           A review of the known prior art shows a need for a laptop  
16       stand designed specifically to relieve the stresses and  
17       discomfort which accompany laptop usage. The known prior art  
18       makes no reference to providing a portable laptop stand for its  
19       common seated use, which reduces the muscle strain in a user's  
20       head, shoulders, neck and back. Therefore, there exists a need  
21       to develop an improved portable laptop stand which relieves the  
22       discomfort in the back, neck, shoulders and wrists of a laptop  
23       user, which is light-weight and compact for convenient  
24       transportation, and which maintains the flexibility to be used in  
25       a number of different ways (e.g., on a table, on a lap while  
26       sitting, etc.).

1        SUMMARY OF THE INVENTION

2           An object of the present invention is to provide an easy to  
3        use portable laptop computer stand which alleviates the muscle  
4        strains normally associated with laptop usage. More  
5        particularly, the invention provides a portable computer stand  
6        specifically designed to reduce muscle strain in a user's neck.  
7        The present invention also discloses a particular height which  
8        allows the typical laptop user to direct his/her eyes more  
9        horizontally as well. This unique design also helps keep a  
10      user's head level, thereby further relieving neck strain usually  
11      associated with laptop use. That is, the stand includes a raised  
12      and tilted work surface (preferably 38 degrees) so a user is not  
13      forced to crane his/her neck, thereby alleviating the muscle  
14      stress associated with laptop usage. The raised and tilted work  
15      surface allows a user's eyes to focus more horizontally, keeping  
16      the user's head level. By keeping a user's head up, the stress  
17      on the user's neck is reduced considerably.

18           Another object of the invention is to alleviate the back  
19      muscle strain usually associated with laptop usage. The tilt of  
20      the work surface and the raised height of the laptop screen when  
21      extended, approaches eye level. Therefore, to comfortably view  
22      the laptop screen, the user's back can remain upright, relieving  
23      the stress associated with laptop usage. The height of the

1 surface disclosed within the current invention allows a user to  
2 type comfortably without lowering his/her arms to reach the  
3 keyboard. By keeping the user's hands and elbows up, the user's  
4 back remains straightened throughout use. Therefore, the stand  
5 is ergonomically designed to alleviate the back stress normally  
6 accompanying prolonged laptop use.

7 Another object of the invention is to relieve the shoulder  
8 muscle stresses associated with laptop use. As described above,  
9 the raised and tilted work surface keeps a user's head level and  
10 back straightened. This positioning aligns the user's head and  
11 spine, therefore forcing the shoulders to be positioned over the  
12 torso. By keeping the shoulders in line, the current invention  
13 reduces or eliminates muscle strain usually accompanying  
14 prolonged laptop use.

15 Another object of the current invention is to relieve wrist  
16 strain associated with laptop usage. The raised and tilted work  
17 surface discussed above allows a user to type more comfortably.  
18 The laptop, when placed on the raised and tilted work surface  
19 presents a keyboard which is ergonomically pleasant to a user's  
20 wrists. It is commonly known that a raised and tilted typing  
21 surface is less likely to cause carpal-tunnel syndrome in  
22 frequent typists, as the wrist is allowed to arch properly during  
23 typing. The current invention's raised and tilted work surface

1 allows the laptop (and therefore the laptop keyboard) which is  
2 placed thereon to be raised and tilted, thereby relieving some of  
3 the stress placed on a laptop user's wrists. The height of the  
4 current invention allows a user's wrists to arch correctly,  
5 raising the wrists, elbows and shoulders to a comfortable level.  
6 By keeping a user's wrists up, the current invention aligns the  
7 user's hand, wrist and arm. This alignment provides a user with  
8 maximum comfort and could help prevent the onset of carpel-tunnel  
9 syndrome, and could relieve the wrist muscle stresses normally  
10 associated with laptop usage.

11 Yet another object of the invention is to provide a sturdy,  
12 safe and comfortable working area for use with a laptop computer.  
13 One embodiment contains a shelf between the legs of the stand,  
14 below the surface. This shelf increases the sturdiness of the  
15 invention by providing extra lateral support. The extra support  
16 allows the user to enjoy working with a laptop on the invention  
17 without worrying about the unit collapsing, dumping its contents,  
18 or injuring the user.

19 Still another object of the invention is to provide a  
20 portable work surface for use with a laptop computer. One  
21 embodiment has hinges which allow the invention to collapse into  
22 a substantially flat unit, suitable for carrying in a briefcase,  
23 carry-on luggage bag, or the like. Prior art desk stands are

1 bulky and awkward for traveling, while the present invention is  
2 small and easily folded to fit in a briefcase or other travel  
3 bag. This allows for the convenient use of one's laptop computer  
4 while away from home or office.

5 Another object of the current invention is to provide a  
6 comfortable office away from the office. Alternative embodiments  
7 of the current invention have storage space for pencils, pens,  
8 paper, and work. Further, the shelf beneath the computer surface  
9 allows the user to keep any necessary materials (i.e. disks,  
10 papers, notebooks, etc.) within reach to use when needed.

11 Other objects, features, and characteristics of the present  
12 invention, as well as the methods of operation and functions of  
13 the related elements of the structure, and the combination of  
14 parts and economies of manufacture, will become more apparent  
15 upon consideration of the following detailed description with  
16 reference to the accompanying drawings, all of which form a part  
17 of this specification.

18

19 BRIEF DESCRIPTION OF THE DRAWINGS

20 A further understanding of the present invention can be  
21 obtained by reference to a preferred embodiment set forth in the  
22 illustrations of the accompanying drawings. Although the  
23 illustrated embodiment is merely exemplary of systems for

1 carrying out the present invention, both the organization and  
2 method of operation of the invention, in general, together with  
3 further objectives and advantages thereof, may be more easily  
4 understood by reference to the drawings and the following  
5 description. The drawings are not intended to limit the scope of  
6 this invention, which is set forth with particularity in the  
7 claims as appended or as subsequently amended, but merely to  
8 clarify and exemplify the invention.

9 For a more complete understanding of the present invention,  
10 reference is now made to the following drawings in which:

11 FIG. 1 shows a prior art computer stand according to U.S.  
12 Patent No. 5,722,624;

13 FIG. 2A shows a perspective view of a prior art collapsible  
14 laptop support according to U.S. Patent No. 5,511,758;

15 FIG. 2B shows a side view of the prior art collapsible  
16 laptop support according to U.S. Patent No. 5,511,758;

17 FIG. 3 shows a prior art laptop support according to U.S.  
18 Patent No. 6,115,249;

19 FIG. 4 is a perspective view of the preferred embodiment of  
20 the portable computer stand according to the invention;

21 FIG. 4A shows a side view of the portable computer stand  
22 depicted in FIG. 4;

23 FIG. 4B is a front view of the portable computer in a

1 collapsed position;

2 FIG. 4C is a side view of the preferred embodiment of the  
3 present invention in a collapsed position;

4 FIG. 5 shows a side view of the preferred embodiment of a  
5 hinge assembly, for use in connection with the portable computer  
6 stand of the present invention;

7 FIG. 6 shows a top plan view of a "snap-in" fastener of the  
8 hinge assembly depicted in FIG. 5;

9 FIG. 7A shows a front view of an alternative embodiment of  
10 the portable computer stand according to the present invention;

11 FIG. 7B shows a side view of the portable computer stand  
12 shown in FIG. 7A; and

13 FIG. 7C shows a top plan view of the portable computer stand  
14 shown in FIG. 7A.

15

16 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

17 As required, a detailed illustrative embodiment of the  
18 present invention is disclosed herein. However, techniques,  
19 systems and operating structures in accordance with the present  
20 invention may be embodied in a wide variety of forms and modes,  
21 some of which may be quite different from those in the disclosed  
22 embodiment. Consequently, the specific structural and functional  
23 details disclosed herein are merely representative, yet in that

1 regard, they are deemed to afford the best embodiment for  
2 purposes of disclosure and to provide a basis for the claims  
3 herein which define the scope of the present invention. The  
4 following presents a detailed description of a preferred  
5 embodiment (as well as some alternative embodiments) of the  
6 present invention.

7 Referring first to FIG. 4, shown is a perspective view of  
8 the preferred embodiment of the present invention. As depicted,  
9 back 33 is connected to side panels 35 and 35' via hinges 37.  
10 Back 33 is also connected to surface 31 via hinges 37. Surface  
11 31 rests on the edges of side panels 35 and 35', thereby allowing  
12 surface 31 to remain in a raised and tilted position. Surface 31  
13 of the preferred embodiment of the present invention is textured  
14 to keep materials from slipping around on surface 31.  
15 Preferably, surface 31 is between twelve and seventeen inches  
16 wide to accommodate a wide range of work environments. In the  
17 preferred embodiment, surface 31 measures approximately twelve  
18 inches to accommodate a laptop or notebook computer. In  
19 alternative embodiments, surface 31 has a much smaller width to  
20 provide a comfortable work area for devices smaller than laptops  
21 (e.g., PDA's, etc.) or a surface for paperwork, or surface 31 has  
22 a width as large as seventeen inches to accommodate a laptop,  
23 mousepad and pencil holding devices built in. Surface 31 is

1 smooth, flat and free from any encumbrances in its preferred  
2 embodiment. However, in alternative embodiments, surface 31 may  
3 be textured and may include a non-slip surface, or may be form-  
4 fitted to hold pencils and other work tools. Surface 31 may also  
5 contain work enhancement objects such as a clip for holding  
6 documents, a built in reading lamp, a mousepad, etc. Also,  
7 surface 31 is preferably between ten and fourteen inches deep.  
8 The depth of surface 31 allows a user to maximize comfort as well  
9 as work area. In the preferred embodiment, surface 31 is  
10 approximately twelve inches in depth (i.e., deep enough to  
11 accommodate a laptop or notebook computer). The front of surface  
12 31 preferably extends from the top of side panels 35 and 35',  
13 located approximately three inches off a user's lap, to the top  
14 of side panels 35 and 35' at back 33, approximately between seven  
15 and ten inches off the user's lap. Surface 31 is preferably  
16 positioned at an angle of between thirty and sixty degrees. In  
17 the preferred embodiment, surface 31 extends from the front of  
18 the present invention, approximately three inches above a user's  
19 lap, to back 33 of the present invention, approximately nine  
20 inches above a user's lap, where surface 31 is positioned at an  
21 angle of approximately thirty-eight degrees.

22 Changing the dimensions of side panels 35 and 35' will  
23 result in altering the height and tilt of surface 31. Side

1 panels 35 and 35' preferably provide approximately two to six  
2 inches in height to the present invention to allow the user  
3 maximum comfort in working. The user's hands, wrists, neck,  
4 shoulders and back are most comfortable working on surface 31  
5 located two to six inches above the user's lap. In the preferred  
6 embodiment of the invention, side panels 35 and 35' are three  
7 inches high, allowing the user to work on a surface three inches  
8 above his/her lap, or other flat work surface. This embodiment  
9 is especially useful during airline travel, as it allows a user  
10 to work on an airplane tray table in a relaxed manner. Raised  
11 and tilted surface 31 maintains an adequate distance between the  
12 unit and the back of the seat in front of the user, even when the  
13 front of that seat is reclined, to allow the user to work  
14 comfortably throughout the flight.

15 Further, in an alternative embodiment, side panels 35 and  
16 35' are wide enough to allow a user to set side panels 35 and 35'  
17 down on his/her lap while utilizing the present invention. For  
18 example, side panels 35 and 35' may be two to three inches wide,  
19 with twelve to twenty inches between them. In alternative  
20 embodiments, side panels 35 and 35' are spaced apart such that  
21 the user can comfortably place the invention over his/her lap  
22 (i.e., with the lap fully between side panels 55 and 55'). In  
23 yet another alternative embodiment, side panels 35 and 35' may

1 have an attachment on the bottom of side panels 35 and 35' which  
2 extends between them to comfortably rest on a user's lap.

3 Further depicted in FIG. 4 is lip 39 centered on the front  
4 edge of surface 31, midway between side panels 35 and 35', and  
5 raised in order to keep items such as laptop computers from  
6 slipping off surface 31. In alternative embodiments, lip 39 can  
7 be of varying lengths, or extending completely from side panel 35  
8 to side panel 35'. In another alternative embodiment, lip 39 can  
9 be off center, or several lips can be present. Lip 39, like the  
10 rest of the present invention, may be constructed from any hard  
11 material such as wood, metal or hard plastics, or may be  
12 constructed from softer materials such as sponge, foam or soft  
13 plastics. Lip 39 may also be covered by a pillow-like material  
14 to enhance the user's comfort in the wrists and help minimize or  
15 even prevent carpal-tunnel syndrome. Lip 39 may have a  
16 rectangular, semicircular, triangular or other shaped cross-  
17 section. Lip 39 may also have a form-fitted base to snugly fit a  
18 laptop computer, handheld PC, pens, paper or PDA. In yet another  
19 alternative embodiment, lip 39 may be attached anywhere on  
20 surface 31 to allow for useful attachments. For example, lip 39  
21 may be attached two inches from the end of surface 31, and a  
22 pencil case may be placed within the remaining two inches. Lip  
23 39 need not be linear, nor must it be attached in a manner

1 parallel to any edge of surface 31. An especially preferred  
2 embodiment of lip 39 is small and narrow, as well as centered on  
3 surface 31 to allow access to a laptop's CD-ROM and disk drives.  
4 Different examples of lips are those specially designed to grip  
5 laptops, notebook computers, paperwork, PDAs and lips that  
6 contain cupholders and other accessories.

7 Still referring to FIG. 4, hinges 37 are used to connect the  
8 separate parts of the present invention. With respect to each  
9 connection, hinges 37 are located along a parallel axis to afford  
10 stability and uniformity. A plurality of hinges is used to  
11 increase stability and durability, most preferably an odd number  
12 of hinges. In the most preferred embodiment shown in FIG. 4, one  
13 of hinges 37 is located midway along the unit's axis (i.e.,  
14 midway between side panels 35 and 35'), and two are located along  
15 the axis, equidistant from the midway point of the axis. The  
16 symmetry around the midway point also increases stability and  
17 durability, as well as simplicity during storage of the folded  
18 unit.

19 Referring next to FIG. 4A, shown is a side view of a  
20 preferred embodiment the present invention. In this embodiment,  
21 surface 31 is connected to back 33 with hinges, surface 31 rests  
22 on side panel 35, and back 33 is connected to side panel 35 at  
23 hinges 37. This preferred embodiment is collapsible into a very

1 thin apparatus by raising surface 31, then folding side panel 35  
2 inward, (another side panel located on the opposite side folds  
3 inward as well) and then lowering surface 31 over back 33 and  
4 side panels 35.

5 Still referring to FIG. 4A, hinges 37 allow side panel 35 to  
6 fold flat on top of back 33. In this preferred embodiment,  
7 hinges 37 are arranged in such a way that the collapsed stand has  
8 a depth of one half inch. In alternative embodiments, hinges 37  
9 may be arranged such that the collapsed stand has a depth of less  
10 than one inch, to facilitate storage in a briefcase, airplane  
11 carry-on bag, or like totting device.

12 In the preferred embodiment depicted in FIG. 4A, surface 31  
13 is positioned at an angle  $\alpha$  with the horizontal plane, and has  
14 flap 32 which extends vertically downward from surface 31, and  
15 fits snugly over top front of side panel 35 to prevent wobbling  
16 of surface 31 and to lock it in place. Flap 32 is a U-shaped  
17 appendage attached to both sides of the bottom of surface 31, the  
18 purpose of which is to lock surface 31 to side panel 35. Flap 32  
19 may limit the range of motion of side panel 35, allowing it to  
20 extend to a maximum position perpendicular to back 33. Flap 32  
21 may include a notch or other means for securing side panel 35 in  
22 position perpendicular to back 33. In alternative embodiments,  
23 flap 32 attaches to said side panel using a temporary attaching

1 means such as velcro or magnets, providing the stand with greater  
2 stability and support. Therefore, side panels 35 will always be  
3 in the proper position to offer ultimate comfort, and proper  
4 support.

5 In alternative embodiments, side panel 35 can be replaced  
6 with several other side panel units, with varying shapes, in  
7 order to vary angle  $\alpha$  and the height of surface 31. Preferably,  
8 angle  $\alpha$  is within the range of thirty to forty-five degrees. In  
9 a most preferred embodiment, angle  $\alpha$  is thirty-eight degrees.

10 Referring next to FIG. 4B, shown is a front view of the  
11 preferred embodiment of the present invention in a collapsed  
12 position. As depicted, side panels 35 and 35' fold along hinges  
13 37 to a position approximately parallel to back 33. Surface 31  
14 folds along hinges 37 to a position approximately parallel to  
15 back 33. When collapsed, the unit comprises four panels  
16 approximately parallel to one another, in a substantially stacked  
17 position. In the preferred embodiment, all four panels fold so  
18 as to be exactly parallel with one another, creating a thin stack  
19 for simple storage and carrying. Therefore, the preferred  
20 embodiment, in a collapsed state, is only as thick as the depth  
21 of the panels, as depicted in FIG. 4C. In alternative  
22 embodiments, the unit further comprises a handle for easy

1 transportation, and a locking mechanism to keep all four panels  
2 stationary throughout transit.

3 Referring now to FIG. 5, shown is a side view of a hinge  
4 assembly according to the preferred embodiment of the present  
5 invention. Depicted is hinge 41 attaching back 43 and side panel  
6 45. In this embodiment, side panel 45 is attached to the wedge  
7 and back 43 contains the holders depicted in FIG. 6. Further,  
8 the connection comprises hook 44 to allow the unit to appear  
9 seamless, as the end of side panel 45 can be positioned flush to  
10 back 43, and at a right angle thereto. Hook 44 is a right angle,  
11 but in alternative embodiments, hook 44 can be of varying angles  
12 and lengths, or nonexistent.

13 Referring next to FIG. 6, shown is a top plan view of a  
14 "snap-in" fastener of the hinge assembly depicted in FIG. 5. As  
15 shown, hinge 41 comprises an interlocking device created by wedge  
16 47 interlocking with holders 48 and 48'. In a most preferred  
17 embodiment, wedge 47 is constructed such that it has tips 49 and  
18 49' wherein said tips comprise a locking means to interlock with  
19 holders 48 and 48'. Hinge 41 is then constructed by forcing tips  
20 49 and 49' toward one another and squeezing tips 49 and 49' of  
21 wedge 47 between holders 48 and 48', which are separated by a  
22 distance approximately equal to the distance between tips 49 and  
23 49'. The locking device of tips 49 and 49' are then integrated

1 with holders 48 and 48' to form the interlocking device. In the  
2 preferred embodiment, holders 48 and 48' are located on parts of  
3 the present invention. In other words, hinge 41 is constructed  
4 by connecting the panels of the current invention, with wedge 47  
5 attached to one panel (i.e. the surface) and holders 48 and 48'  
6 integrated as part of another panel (i.e., the back). Thus, the  
7 unit of the preferred embodiment is connected by a plurality of  
8 hinges similar to hinge 41.

9           In a most preferred embodiment, wedge 47 is constructed in a  
10 "W" shape, with points on tips 49 and 49' to lock wedge 47 within  
11 holders 48 and 48'. In this manner, hinge 41 allows for a  
12 virtually seamless connection between panels in the preferred  
13 embodiment of the present invention.

14           Referring next to FIG. 7A, shown is a front view of one  
15 embodiment of portable computer stand 50 according to the present  
16 invention. As shown, portable stand 50 comprises surface 51  
17 having lip 57, legs 53 and shelf 55. Surface 51 is attached to  
18 legs 53 through any attachment means commonly known in the art  
19 with shelf 55 positioned between legs 53 below surface 51. Legs  
20 53 preferably provide approximately two to six inches in height  
21 to stand 50 to allow the user maximum comfort in working. The  
22 user's hands, wrists, neck, shoulders and back are most  
23 comfortable working on surface 51 located two to six inches above

1 the user's lap. In the preferred embodiment of the invention,  
2 legs 53 are three inches high, allowing the user to work on a  
3 surface three inches above his/her lap, or other flat work  
4 surface. This embodiment is especially useful during airline  
5 travel, as it allows a user to work on an airplane tray table in  
6 a relaxed manner. Raised and tilted surface 51 maintains an  
7 adequate distance between the unit and the back of the seat in  
8 front of the user, even when the front of that seat is reclined,  
9 to allow the user to work comfortably throughout the flight.

10 Further, one alternative embodiment of the present invention  
11 comprises legs 53 which are wide enough to allow a user to set  
12 legs 53 down on his/her lap while utilizing stand 50. For  
13 example, legs 53 may be two to three inches wide, with twelve to  
14 twenty inches between them. In alternative embodiments, legs 53  
15 are spaced apart such that the user can comfortably place the  
16 invention over his/her lap (i.e., with the lap fully between legs  
17 3). In yet another alternative embodiment, legs 53 may have an  
18 attachment on the bottom of legs 53 which extends between them to  
19 comfortably rest on a user's lap. In a preferred embodiment, the  
20 present invention is used on an airplane during travel. Raised  
21 and tilted work surface 51 maintains a comfortable distance  
22 between the user and the rear of the seat in front of the user,  
23 even when the seat in front of the user is reclined.

1           In the embodiment depicted by FIG. 7A, surface 51 is smooth,  
2       flat and free from any encumbrances. However, surface 51 may be  
3       textured and may include a non-slip surface, or may be form-  
4       fitted to hold pencils and other work tools. Surface 51 may also  
5       contain work enhancement objects such as a clip for holding  
6       documents, a built in reading lamp, a mousepad, etc.

7           Also shown in FIG. 7A is lip 57 along the front edge of  
8       surface 51, which provides support to keep articles on surface 51  
9       (i.e., to prevent those articles from shifting, sliding or  
10      falling off surface 51). Lip 57, like the rest of stand 50, may  
11      be constructed from any hard material such as wood, metal or hard  
12      plastics, or may be constructed from softer materials such as  
13      sponge, foam or soft plastics. Lip 57 may also be covered by a  
14      pillow-like material to enhance the user's comfort in the wrists  
15      and help minimize or even prevent carpel-tunnel syndrome.  
16      Preferably, surface 51 is between twelve and seventeen inches  
17      wide to accommodate a wide range of work environments. In the  
18      preferred embodiment, surface 51 measures approximately twelve  
19      inches to accommodate a laptop or notebook computer. In  
20      alternative embodiments, surface 51 has a much smaller width to  
21      provide a comfortable work area for devices smaller than laptops  
22      (e.g., PDA's, etc.) or a surface for paperwork, or surface 51 has

1 a width as large as seventeen inches to accommodate a laptop,  
2 mousepad and pencil holding devices built in.

3       Also, surface 51 is preferably between ten and fourteen  
4   inches deep. The depth of surface 51 allows a user to maximize  
5   comfort as well as work area. In the preferred embodiment,  
6   surface 51 is approximately twelve inches in depth (i.e., deep  
7   enough to accommodate a laptop or notebook computer). The front  
8   of surface 51 preferably extends from the top of legs 53, located  
9   approximately three inches off a user's lap, to the top of legs  
10   53 at back of the unit, approximately between seven and ten  
11   inches off the user's lap. Surface 51 is preferably positioned  
12   at an angle of between thirty and forty-five degrees. In the  
13   preferred embodiment, surface 51 extends from the front of the  
14   stand 50, approximately three inches above a user's lap, to the  
15   back of stand 50, approximately nine inches above a user's lap,  
16   where surface 51 is positioned at an angle of approximately  
17   thirty-eight degrees.

18       In one embodiment of the invention, each of legs 53 have  
19   notches on their inner sides for attaching shelf 55. Optionally,  
20   each of legs 53 has multiple sets of notches to allow for height  
21   adjustment of shelf 55. Shelf 55 also provides stand 50 with  
22   extra lateral support, enhancing its stability and durability.  
23   Alternatively, shelf 55 may be attached to legs 53 using

1       brackets. In yet another alternative embodiment, legs 55 have  
2       holes corresponding to different shelf heights, and shelf 55  
3       rests on pins placed into these holes. In still another  
4       alternative embodiment, shelf 55 is mounted on sliding brackets  
5       between legs 53, allowing shelf 55 to slide out towards the user.  
6       In another alternative embodiment, one or more drawers, or  
7       storage area may be located below surface 51 between legs 53.  
8       Shelf 55 may have a flat face, or a form-fitted face with areas  
9       for pencils, paper, or other work tools. Shelf 55 may also have  
10      a clip or other means to hold work tools in place during  
11      adjustment or use of shelf 55. In the preferred embodiment,  
12      shelf 55 is rectangular, however, shelf 55 may be circular,  
13      triangular, hexagonal, or some other shape.

14           In a preferred embodiment, legs 53 may be connected to  
15      surface 51 by hinges. The back of surface 51 is connected to the  
16      back of the unit by hinges, and the back of legs 53 are connected  
17      to the back of the unit by hinges. Once the user removes shelf  
18      55, legs 53 fold along the hinges and the unit collapses into an  
19      easily portable unit. When collapsed, this embodiment measures  
20      approximately twelve inches in length, twelve inches in width,  
21      (i.e., the exact length and width of surface 11) and one and a  
22      half inches in depth.

1 Referring next to FIG. 7B, shown is a side view of one  
2 embodiment of the present invention. Shown are leg 53 and shelf  
3 55. As depicted in FIG. 7B, surface 51 has at its lower (or  
4 front) end lip 57 for holding laptop computer 58 in position on  
5 surface 51. Lip 57 may have a rectangular, semicircular,  
6 triangular or other shaped cross-section. Lip 57 may also have a  
7 form-fitted base to snugly fit a laptop computer, handheld PC,  
8 pens, paper or PDA. In yet another alternative embodiment, lip  
9 57 may be attached anywhere on surface 51 to allow for useful  
10 attachments. For example, lip 57 may be attached two inches from  
11 the end of surface 51, and a pencil case may be placed within the  
12 remaining two inches. Lip 57 need not be linear, nor must it be  
13 attached in a manner parallel to any edge of surface 51. An  
14 especially preferred embodiment of lip 57 is small and narrow, as  
15 well as centered on surface 51 to allow access to a laptop's CD-  
16 ROM and disk drives. Different examples of lips are those  
17 specially designed to grip laptops, notebook computers,  
18 paperwork, PDAs and lips that contain cupholders and other  
19 accessories.

20 Referring still to FIG. 7B, shown is the position of shelf  
21 55, which is fixed in a position below surface 51, and above the  
22 bottom of leg 53. In alternative embodiments, a plurality of  
23 shelves may be included, adjustable or movable. In yet another

1 alternative embodiment, shelf 55 may be positioned adjacent to  
2 the bottom of leg 53, thereby forming a base for stand 50. This  
3 base may have a flat, textured or form fitted top side, and a  
4 flat, form fitted, textured or padded bottom side. The bottom  
5 side of this base can serve as a padded cushion for use on the  
6 user's lap. In yet another embodiment, a shelf may be placed  
7 between the base and the surface such that the unit contains both  
8 a base and a shelf, each containing a top side that may be used  
9 as a storage area for papers, books, and other necessary work  
10 items. This embodiment provides increasing stability due to the  
11 presence of multiple lateral supports.

12 Referring next to FIG. 7C, shown is a top plan view of one  
13 embodiment of the portable computer stand 50 of the present  
14 invention. In particular, FIG. 7C shows surface 51 with lip 57  
15 on its front edge, centered along the edge, and legs 53 extending  
16 from the back of surface 51. This design increases comfort for  
17 the user, as the long and wide legs distribute the weight of  
18 stand 50 and its contents more uniformly on a user's lap.

19

20 While the present invention has been described with  
21 reference to one or more preferred embodiments, such embodiments  
22 are merely exemplary and are not intended to be limiting or  
23 represent an exhaustive enumeration of all aspects of the

1 invention. The scope of the invention, therefore, shall be  
2 defined solely by the following claims. Further, it will be  
3 apparent to those of skill in the art that numerous changes may  
4 be made in such details without departing from the spirit and the  
5 principles of the invention. It should be appreciated that the  
6 present invention is capable of being embodied in other forms  
7 without departing from its essential characteristics.

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